

INTERNATIONAL SEARCH REPORT

International application No

PCT/US04/25469

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : A01N 1/02; C07K 14/00, 17/02

US CL : 435/2, 177; 530/350

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 435/2, 177; 530/350

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
Please See Continuation Sheet

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2003/0009024A1 (CURTIS) 9 January 2003 (09.01.2003), paragraphs 9, 71, 77, 157, 206-215.	1, 5, 10, 11, 13
X	US 6,365,338B1 (BULL et al.) 2 April 2002 (02.04.2002), col. 4, line 13, to col. 6, line 30.	1, 5, 10, 11, 13
Y	US 6,030,807 (DE LENCASTRE et al.) 29 February 2000 (29.02.2000), col. 7, lines 58-66.	1, 5, 10, 11, 13
A	WALLBERG-HENRIKSSON et al., "Reversibility of decreased insulin-stimulated glucose transport capacity in diabetic muscle with in vitro incubation," J Biol Chem 262(16):7665-7671, 1987, pp. 7665, 7666, right col., and 7668, left col.	1-57
A	ZEIDLER et al., "Kinetics of 3-o-methyl glucose transport in red blood cells of newborn pigs," J Gen Physiol 67:67-80, 1976, Abstract, pp. 72-74.	1-57

☐ Further documents are listed in the continuation of Box C.☐ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T"

later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X"

document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y"

document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&"

document member of the same patent family

Date of the actual completion of the international search

06 May 2005 (06.05.2005)

Date of mailing of the international search report

02 AUG 2005

Name and mailing address of the ISA/US

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Box No. II Observations where certain claims were found unsearchable (Continuation of Item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:
Please See Continuation Sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☒ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

☐
☐

The additional search fees were accompanied by the applicant's protest.

No protest accompanied the payment of additional search fees.

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BOX III. OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1.

Group I, claim(s) 1-18, drawn to a method for preserving a biomaterial.

Group II, claim(s) 19-36, drawn to a method for preserving mammalian cells, comprising recovering at least a portion of the preserved cells to a viable state.

Group III, claim(s) 37-45, drawn to a method for preserving nucleated mammalian cells, comprising storing the cells dry or frozen and recovering at least a portion of the preserved cells to a viable state.

Group IV, claim(s) 46-57, drawn to a mammalian cell prepared for preservation comprising a non-metabolizable carbohydrate.

The inventions listed as Groups I-IV do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons.

The requirement of unity of invention is not fulfilled because there is no technical relationship among those inventions involving one or more of the same or corresponding special technical features. The expression "special technical features" means those technical features that define a contribution which each of the claimed inventions, considered as a whole, makes over the prior art. Therefore, a technical relationship is lacking among the claimed inventions involving one or more special technical features.

The inventions of Groups I-IV, do not share the common special technical feature of a mammalian cell comprising a transporter molecule and a preservation agent transported by the transporter molecule because Curtis (US 2003/0009024) discloses human, nucleated cells comprising a membrane transport protein designated 65484. This transport protein transports a variety of molecules, such as hexoses, disaccharides, hormones, peptides and neurotransmitters across the cell membrane, and this transport serves to preserve the cell by maintaining normal metabolism and health of the cell (see paragraphs 9, 71, 77, and 157). To preserve cells in which this transport protein is lacking or in which this transport mechanism is deficient, the gene for the transport protein may be cloned into a mammalian expression vector and expressed at the DNA and protein levels in mammalian cells (see paragraphs 206-215). As the human diet contains sugars and peptides, either ingested or as digestion products, and as humans consume pharmaceutical compositions, these compounds come in contact with the cell membranes.

Thus, the technical feature of a mammalian cell comprising a transporter molecule and a preservation agent transported by the transporter molecule does not define the invention over the prior art. Because the common special technical feature is not novel with respect to the cited reference, it is clear that the claims of Groups I-IV lack a single common technical feature that defines them over the prior art.

Further, an international application containing claims to different categories of inventions will be considered to have unity of invention if the claims are drawn only to one of certain combinations of categories:

- (1) A product and a process specially adapted for the manufacture of said product; or
- (2) A product and process of use of said product; or
- (3) ~~A product, a process specially adapted for the manufacture of the said product, and a use of the said product; or~~

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- (4) A process and an apparatus or means specifically designed for carrying out the said process; or
(5) A product, a process specially adapted for the manufacture of the said product, and an apparatus or means specifically designed for carrying out the said process (see 37 CFR 1.475(b)-(d)). In the instant case, the claims are drawn to multiple processes and a product, only a particular combination of which along with Group I may be considered for unity of invention, i.e., Group I and Group IV, (the first named process of using a product and the named product). Other groups are drawn to additional processes, and other combinations do not comply with the aforementioned Rules.

Accordingly, a holding of lack of unity of invention is proper.

Continuation of B. FIELDS SEARCHED Item 3:

USPAT, USPGPUB, EPO, JPO, DERWENT WPI, CAS/STN'S CAPLUS, BIOSIS; search terms: 3-o-methyl-glucose, 2-deoxy-d-glucose, preserve/preservation/storage/store/protect/cryoprotectant, membrane, transport, transporter